Spot Safety Project Evaluation

Project Log # 200505120

Spot Safety Project # 13-98-002

Spot Safety Project Evaluation of the Guardrail installation on US 64 (Sanford Drive) from US 70 to NC 181 in Burke Co.

Documents Prepared By:

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Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 13-98-002 - The Guardrail installation on US 64 (Sanford Drive) from US 70 to NC 181 in Burke County.

Introduction

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naive before and after analysis of the treatment data has been completed to measure the effectiveness of the spot safety improvement. Additional analysis methods were not utilized for this evaluation because a suitable comparison group was unattainable. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of guardrail on US 64 (Sanford Drive) from 50 feet north of US 70 to 50 feet south of NC 181. US 64 is a two-lane, 45-mph facility without left turn lanes within selected section. The initial crash analysis for this intersection was completed from November 1, 1994 to October 31, 1997. There were a total of 18 crashes including a fatal that involved a vehicle hitting the guardrail and traveling over a steep embankment. The reason for the improvement is that this section of US 64 has approximately 4000 feet of substandard guardrail that needed to be replaced. There were also approximately 1500 feet of new guardrail needed along US 64. The final completion date for the guardrail installation along the subject road was on June 1, 1999 at a cost of $60,000.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes along the subject road, the crash data omitted from this analysis to consider for an adequate construction period was from May 1999 through July 1999. The before period consisted of reported crashes from August 1, 1993 through April 30, 1999 (5 years, 9 Months) and the after period consisted of reported crashes from August 1, 1999 through April 30, 2005 (5 Years, 9 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed. The analysis consisted of the treatment data along US 64 from 50 feet north of US 70 to 50 feet south of NC 181 (0’ y-line). The following data table depicts the Naive Before and After Analysis for the above information. Please note that Ran Off Road Crashes were the target crashes for the applied countermeasure. These crash types considered are as follows: Ran Off Road-Left, Ran Off Road-

Right, Ran Off Road-Straight, Overturn/Rollover, Fixed Object, Head-On; Sideswipe, Same Direction; Sideswipe, Opposite Direction.

Treatment Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Total crashes	37	41	10.8
Total Severity Index	9.8	6.7	-31.5
Target Crashes	17	11	-35.3
Target Severity Index	21.0	17.5	-16.8
Volume	8000	8050	0.6
Treatment Injury Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Fatal	1	1	0.0
Class A	2	1	-50.0
Class B	1	6	500.0
Class C	12	5	-58.3
Property Damage Only	21	28	33.3
Target Injury Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Fatal	1	0	100.0
Class A	3	2	-33.3
Class B	1	3	200.0
Class C	4	1	-75.0
Property Damage Only	8	5	-37.5
Crashes over embankment/off road	2	2	0.0
Crashes into guardrail	4	6	50.0

Table 1.

The naive before and after analysis at the treatment location resulted in a 10.8 percent increase in Total Crashes, a 35.3 percent decrease in Target Crashes, and a 0.6 percent increase in Average Daily Traffic (ADT). The Treatment Injury Information resulted in a 0.0 percent change in Fatals, a 50.0 percent decrease for Class A, a 500.0 percent increase for Class B, a 58.3 percent decrease for Class C, and a 33.3 percent increase for Property Damage Only. The Target Injury Information resulted in a 100.0 percent decrease in Fatals, a 33.3 percent decrease for Class A, a 200.0 percent increase for Class B, a 75.0 percent decrease for Class C, and a 37.5 percent decrease for Property Damage Only. The before period ADT year was 1996 and the after period ADT year was 2002.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 10.8 percent increase in Total Crashes and a 35.3 percent decrease in Target Crashes. The summary results above demonstrate that the treatment location appears to have had an increase in the number of Total Crashes and a decrease in the number of Target Crashes from the before to the after period.

Information from the project folder shows the treatment area with substandard guardrail and fair to poor alignment in the before period. After installation of the new guardrail and no change in alignment, referencing Table 1, there is no significant change in any of the categories listed. In the before period there was one crash involving a vehicle traveling over the guardrail and none in the after period. The guardrail seems to perform its intended function well, by keeping vehicles contained in the event of contact with the guardrail face.

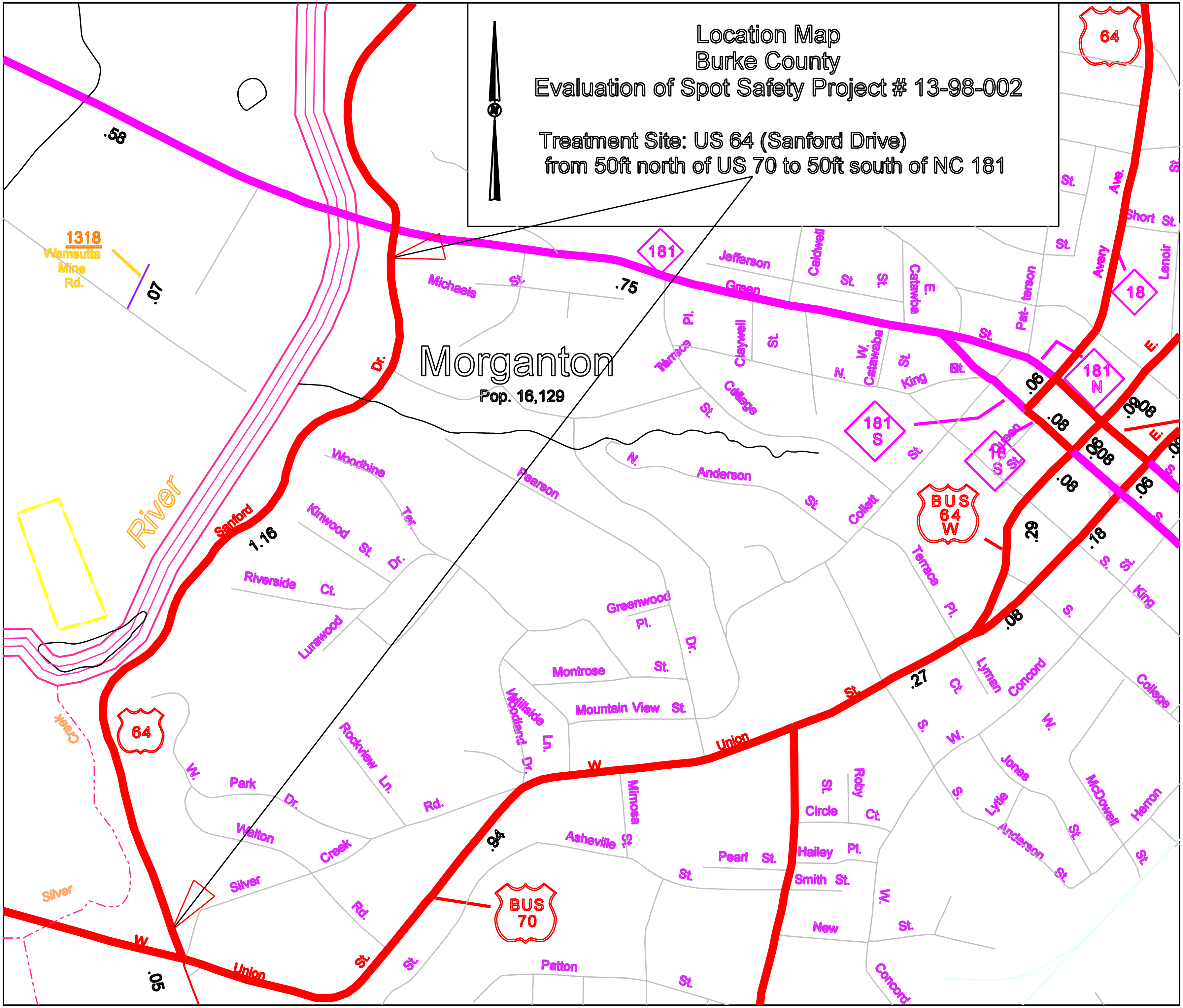
Referencing Table 2 there is an area of interest along US 64. There seems to be a high concentration of crashes within this 0.21-mile strip of road (15.06 to 14.85) from NC 181 to 150 feet past Terrace Place.

	Before	**After**	
Total crashes	19	29	52.6
ran off road	0	3	300.0
rear end	10	11	10.0
left turn, same roadway	1	2	100.0
left turn, different roadway	1	2	100.0
sideswipe, same direction	1	1	0.0
sideswipe, opposite direction	0	1	100.0
head on	0	1	100.0
animal	2	0	-100.0
angle	4	8	100.0

Table 2.

Rear End and Angle collisions are dominant in this area. A study focused on theses crashes in this area may lead to countermeasures to help reduce the crashes for US 64 from NC 181 to US 70.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of road.



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Treatment Site Photos Taken July 28, 2005

The photos are in sequence from US 64 @ NC 181 to US 64 @ US 70.

Turning onto US 64 from NC 181

Turning onto US 64 from NC 181